

A NEW SPECIES OF THE GENUS *SIMULIUM* FROM CHINA (DIPTERA, SIMULIIDAE)

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Abstract This paper describes and illustrates a new species *Simulium phiaison* sp. nov. collected from Northeast China, which belonging to *malyschevi* group in subgenus *Simulium* (*Simulium*). The new species separated from other related species by the larval abdominal integument densely covered with many minute, dark flat spinules.

Key words Simuliidae, *Simulium*, new species, China

The 37 known species of *malyschevi* group in subgenus *Simulium* (*Simulium*) distribute in Oriental Palearctic and Nearctic Regions (Crosskey and Howard, 1997; Adler and Crosskey, 2010). So far, there are 17 known species in China belonging to this group (Chen *et al.*, 2005; Chen, 2007; Chen *et al.*, 2007). In this paper, an additional new species of *malyschevi*-group from China is described. The type specimens are deposited in the Department of Biology of Guiyang Medical University.

Simulium (*Simulium*) *phiaison* sp. nov. (Figs 1-14)

Female. Body length about 2.5 mm. Wing length about 2.2 mm.

Head. Narrower than width of thorax. Frons shiny black. Frontal ratio 5.9: 5.4: 4.9, frons-head ratio 5.9: 18.5. Clypeus shiny black, grey-pruinose, covered with some black hairs. Antenna composed of 2+9 segments, which are brownish except scape and pedicel yellow. Maxillary palp with 5 segments in proportion of 3rd to 5th segments 4.5: 3.8: 6.7, sensory vesicle of medium size, about 0.33 times as long as respective segment. Maxilla with about 11 inner teeth and 9 outer ones. Mandible with about 27 inner teeth and 10 outer ones. Cibarium lacking denticles but with a median projection on posterior border.

Thorax. Scutum shiny black, grey-pruinose, covered with fine yellow pubescence and black hairs on prescutellum region. Scutellum black with some brown hairs. Postsutellum black and bare. Pleural membrane and katapisternum bare. Legs. Fore coxa and trochanter yellow; mid and hind coxae and trochanters brown. Fore and mid femora yellowish with distal 1/4 brown; hind femur yellowish with distal 1/3 dark brown. All tibiae brownish black with large yellowish patch medially on outer surface. All

tarsi brownish black except basal 4/5 of mid basitarsus and basal 4/5 of second tarsomere, and basal 3/4 of hind basitarsus and basal 1/2 of second tarsomere, which are yellowish. Fore basitarsus somewhat dilated distally, about 4.0 times as long as its greatest width. Hind basitarsus nearly parallel-sided. W:L= 1.0: 5.5. Calipala and pedisulcus well developed. Each claw with a small basal tooth. Wing. Costal with spinules as well as hairs, subcostal distal 2/3 hairy. Basal section of radius bare. Hair tuft at base of costa and stem vein brownish black.

Abdomen. Basal scale yellowish brown with a fringe of brown hairs. Terga dark. Genitalia. The ventral surface of the 7th sternite bears a patch of branched, long setae. The 8th sternite with about 20 black hairs on each side. Anterior gonapophyses widely separated from each other, in ventrolateral view, thin, membranous, covered with about 12 short setae and numerous microsetae, their posterior end broadly rounded and inner margins subparallel-sided, which are not so thickened. Genital fork with sclerotized slender stem, anterior tip of the stem is somewhat flattened, each arm with a small sclerotized projection directed anterodorsally. Spermatheca elliptic. Paraproct and cercus of moderate size.

Male. Body length about 2.5 mm. Wing length about 2.0 mm.

Head. Slightly wider than thorax. Upper eye consisting of large facets in 17 horizontal rows and 16 ventral columns. Clypeus dark, grey-pruinose and covered with some black hairs. Antenna composed of 2+9 segments, dark brown except for pale brown scape and pedicel. 1st flagellar segment somewhat elongated, about 1.6 times as long as following one. Maxillary palp composed of 5 segments, proportional lengths of 3rd to 5th segments 3.2: 3.5: 7.4; 3rd segment

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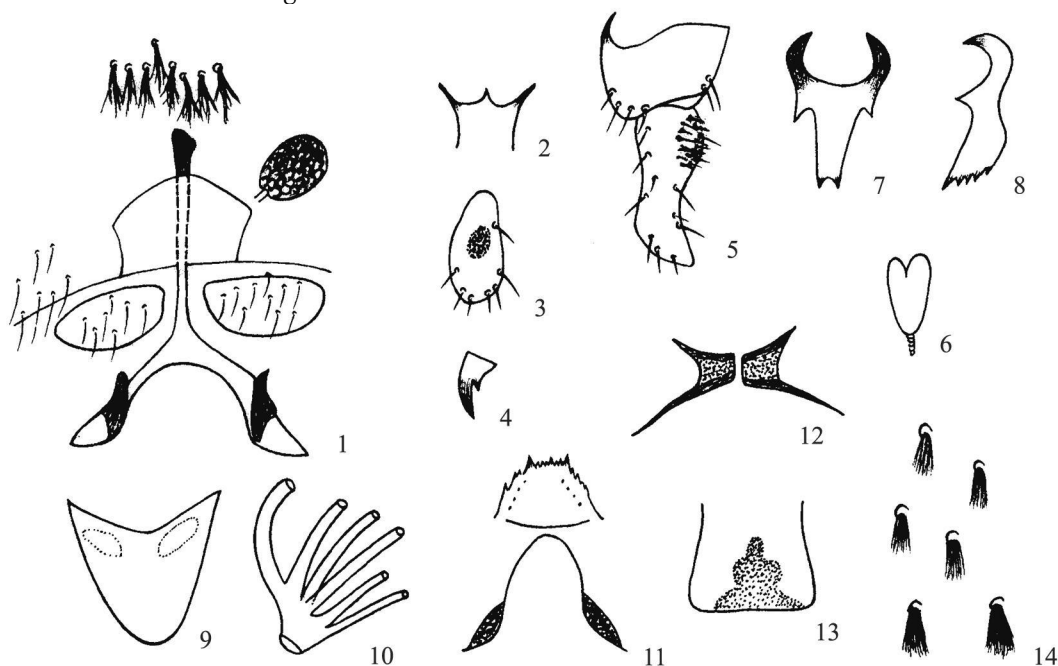
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of normal size with small globose sensory vesicle

Thorax Scutum shiny black, grayish white pruinose and covered with fine yellow pubescence when viewed in certain angle of light scutum with a pair of silvery white spots on shoulders widely separated in the middle and a large white spot on posterior area Scutellum grey with black hairs Postscutellum black and bare Legs All coxae and

trochanters dark brown except fore coxa yellow. Fore and hind femora yellowish with distal 1/3 brown mid femur brown All tibiae brown except middle large portion of outer surface of fore and mid tibiae yellow. Coloration of all tarsi as in female Hind basitarsus somewhat dilated spindle-shaped $W:L = 1.0:4.0$ Calipala and pedisulcus marked Wing Nearly as in female



Figs 1-14 *Simulium (Simulium) piakou* sp. nov. 1. Female genitalia 2. C-barium. 3. 3rd segment of maxillary palp and sensory vesicle 4. Claw of female 5. Coxite and style of female 6. Median sclerite 7. Ventral plate in ventral view. 8. Ventral plate in lateral view. 9. Cocoon 10. Pupal filaments 11. Larval head capsule in ventral view. 12. Larval anal sclerite 13. Larval head spots 14. Dark flat spinules of larval abdomen

Abdomen Nearly as in female except terga with yellow hairs Genitalia Coxite in ventral view about 0.8 times as long as wide and about 0.7 times as long as style Style gradually broadened towards basal 1/3 and about 2.5 times as long as its greatest width near basal 1/3 Each style lacking apical spine but with rounded basal protuberance which bearing a cluster of strong setae Ventral plate has a broad base plate body long plate-form and almost smooth in ventral view; arms gently curved inward and each with distinct wing-like projection Parameres each with numerous paramenal hooks Median sclerite plate-form, gradually widened distally and with bifid tip

Pupa Body length about 2.8 mm

Head and thorax Integument yellowish brown, almost without tubercles except on dorsal and lateral surface of thorax which have some minute tubercles Head with 3 pairs of short simple trichomes whereas thorax with 4 pairs of simple trichomes Gill organ with 6 filaments arranged in pairs, very short-stalked

but the middle pair usually sessile, subequal in length and about 1/2 the length of pupal body

Abdomen Tergum 2 with 5 short and 1 long simple setae on each side terga 3 and 4 with 4 hooked spines on posterior margins on each side terga 7-9 each with a cross row of spine-combs terminal hooks absent Sternum 5 with a pair of bifid hooks submedially on each side sterna 6 and 7 each with a pair of bifid hooks widely spaced on each side Cocoon Wall-pocket-shaped, tightly woven, extending ventrolaterally, with a thick anterior margin and have large antero-lateral windows on each side

Mature larva Body length about 5.0 mm. Cephalic apotome with positive calabash-shaped head spots Antenna composed of 4 segments in proportion of 3.4: 3.2: 4.1: 0.3 Cephalic fan each with 36-38 main rays Mandibular serration composed of large and small teeth but lacking supernumerary serration Hypostomial teeth 9 in number, corner and median teeth slightly prominent lateral serration weakly developed apically. 3-4 hypostomial setae on each side

lying subparallel to lateral margins. Postgenal cleft deep rounded, almost reaching posterior margin. Thoracic integument bare but abdominal integument moderately covered with a lot of minute, dark flat spinules on segments 6-8. Rectal gill lobes compound, each with 5-6 finger-like secondary lobes. Anal sclerite of usual X -formed with anterior arms about 0.8 as long as posterior ones. Ventral papilla absent.

Holotype ♀, reared from pupa, slidemounted with its associated pupal skin and cocoon, was collected in a small fast flowing stream from Dongning Suifenhe City, Heilongjiang (44° 50' N, 131° 18' E; alt 455 m), 15 Aug. 2007. Paratypes 4 ♀♀, 8 ♂♂, 15 pupae and 20 larvae on the same day as holotype by WU Hui. 5 Pupae, 2 larvae, Suiyang Suifenhe, Heilongjiang, 1♀, 6 pupae and 15 larvae Sandaoguan, Mudanjiang City, Heilongjiang, the pupae and larvae were taken from trailing grasses exposed to the sun by WU Hui. 7 ♂♂, 2♀♀, and 10 pupae Chunhua Jilin (43° 10' N, 131° 20' E; alt 600 m), 1 larva Changbaishan, Jilin were taken from decaying leaves and submerged grass by HUANG Ruoyang. 1♀, 9 pupae, 2 larvae Tanghe, Benxi Liaoning (41° 18' N, 124° 17' E; alt 80 m), 1♀, 13 pupae, 3 larvae Xinbin, Liaoning (41° 44' N, 125° 3' E; alt 328 m), by FAN Wei and YANG Ming.

Distribution. China (Heilongjiang, Jilin, Liaoning).

Remarks. The present new species belongs to the *malyschewi*-group of *Simulium* (*Simulium*) as defined by Rubtsov (1956) and Crosskey *et* Howard (1997) by the characteristic feature of female genitalia. It's allied to *S. (S.) hirtipannus* Puri (1932) from India, *S. (S.) jacuticum* Rubtsov (1940) from Siberia, *S. (S.) nacojapi* Smart (1944) from Japan and Siberia and *S. (S.) daningense* Chen *et al.* (2007) from China in several characters including the presence of branched setae on the 7th sternite in the female; the “Y” -form

ventral plate in the male and the pupal cocoon with large antero-lateral windows. The new species, however, can be readily separated from other related species mentioned above by the several combination characters, such as the larval abdominal integument covered with many minute, dark flat spinules, the female character smooth and the arms of genital fork with sclerotized projection, and the basal protuberance of male style only with a cluster of strong setae but without spines.

Etymology. The specific name was given by the abdominal integument of larva densely covered with minute, dark flat spinules on segments 6-8.

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中国蚋属一新种 (双翅目, 蚋科)

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摘要 报道采自东北地区 1 新种, 刺毛蚋 *S. (S.) spialum* sp. nov., 该种隶属于蚋属蚋亚属的淡足蚋组 *Simulium malyschewi*-group. 新种主要特征是幼虫第 6 至 8 腹节密被分

关键词 蚋科, 蚋属, 新种, 中国.

中图分类号 Q969.42.9

枝扁毛, 雌虫食窦无疣突, 雄虫抱肢端节基背突仅具强毛而无刺。据此综合特征可与已知的近缘种相区别。

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